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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,542	04/15/2004	Alan Robinson	920537-95908	8240

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BARNES & THORNBURG LLP  
P.O. BOX 2786  
CHICAGO, IL 60690-2786

EXAMINER
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SINGH, DALZID E

ART UNIT	PAPER NUMBER
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2613

NOTIFICATION DATE	DELIVERY MODE
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07/01/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patent-ch@btlaw.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/825,542	<b>Applicant(s)</b> ROBINSON, ALAN	
	<b>Examiner</b> Dalzid Singh	<b>Art Unit</b> 2613	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 March 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) 18-21,38,43 and 44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7,15-17,22-29,35-37,41 and 42 is/are rejected.
- 7) ☒ Claim(s) 8-14,30-34,39 and 40 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5, 7, 15-17, 22-29, 37, 41 and 42 rejected under 35 U.S.C. 103(a) as being unpatentable over Franco et al (US Patent No. 6,538,788).

Regarding claims 1 and 23 (in view of the 112 rejection), Franco et al disclose optical communications system, as shown in Fig. 1, comprising:

a transmitter (2);

a receiver (1);

an optical communications link (4) between the transmitter and receiver comprising a plurality of spans; and

at least one line amplifier (9) between spans of the communications link, wherein the receiver comprises:

optical to electrical conversion circuitry for converting the received optical signal to an electric signal (it is inherent that the system comprises optical to electrical converter); and

digital signal processing means for analyzing the electrical digital signal, wherein the digital signal processing means derives information concerning characteristics of

individual spans from the electrical digital signal (see col. 10, lines 53-67 to col. 11, lines 1-7; col. 12, lines 66-67 to col. 13, lines 1-13) by spatially resolving non-linear distortion from different parts of the optical communication link (col. 13, lines 14-59 discloses various devices/components may be placed in the transmission line; col. 14, lines 25-37 described that the optical component may be optical fiber; and col. 19, lines 8-17 disclose digitally measuring the effects of non-linear distortions of the devices located in the transmission line; the term "spatially resolving" has been broadly interpreted as *obtaining various measurements in the transmission line and determining error based on such measurement*).

Franco et al do not disclose analogue to digital conversion circuitry however, Franco et al teach digital signal. Therefore, it would have been obvious that there exist analog to digital signal converter in order to enable interface between optical signal and digital processor.

Regarding claims 2, 5, 15, 24, 27 and 36, Franco et al disclose analyzing the signal and differ from the claimed invention in that Franco et al do not disclose wherein the means for analyzing the electrical digital signal analyses a self phase modulation effect within the received signal or wherein the means for analyzing the electrical digital signal analyses a four wave mixing effect. However, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to program the processor so that it will process the digital signal as such. The claims recites various analysis of the signal, which suggest that such limitation lack criticality.

Regarding claims 3 and 25, Franco et al do not disclose that the means for analyzing the electrical digital signal analyses a self phase modulation effect at installation of the system, or on an unused wavelength of a system which is in service. However, it would have been obvious to an artisan of ordinary skill in the art to analyze the signal at installation.

Regarding claims 4 and 26, Franco et al do not disclose wherein the means for analyzing the electrical digital signal analyses a self phase modulation effect in-service. However, it would have been obvious to an artisan of ordinary skill in the art to analyses a self phase modulation effect in-service in order to detect variation of the signal.

Regarding claims 7 and 29, , Franco et al do not disclose wherein the means for analyzing the electrical digital signal analyses a cross phase modulation effect in-service. However, it would have been obvious to an artisan of ordinary skill in the art to detect variation of the signal.

Regarding claim 16, a system as claimed in claim 15, wherein the means for analyzing the electrical digital signal analyses a four wave mixing response between pulsed waveforms. In analyzing the signal for four wave mixing it would have been obvious to analyze between pulsed waveforms, since four wave mixing occur between channels.

Regarding claim 17, Franco et al do not disclose wherein the means for analyzing the electrical digital signal analyses a four wave mixing response between pulsed and continuous waveforms. However, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to provide four wave mixing between pulsed and continuous waveforms.

Regarding claim 22, Franco et al disclose a receiver for use in an optical communications system for receiving an optical signal from an optical link comprising a plurality of spans, the receiver comprising:

optical to electrical conversion circuitry for converting a received optical signal to an electric signal (it is inherent to provide optical to electrical conversion);

digital signal processing means for analyzing the electrical digital signal, wherein the digital signal processing means derives information concerning characteristics of individual spans from the electrical digital signal (see col. 10, lines 53-67 to col. 11, lines 1-7; col. 12, lines 66-67 to col. 13, lines 1-13) by spatially resolving non-linear distortion from different parts of the optical communication link (col. 13, lines 14-59 discloses various devices/components may be placed in the transmission line; col. 14, lines 25-37 described that the optical component may be optical fiber; and col. 19, lines 8-17 disclose digitally measuring the effects of non-linear distortions of the devices located in the transmission line; the term "spatially resolving" has been broadly

interpreted as *obtaining various measurements in the transmission line and determining error based on such measurement*).

Franco et al do not disclose analogue to digital conversion circuitry however, Franco et al teach digital signal. Therefore, it would have been obvious that there exist analog to digital signal converter in order to enable interface between optical signal and digital processor.

Regarding claim 41, a computer-readable medium embodying a computer program comprising code means for implementing a method of monitoring characteristics of an optical link in an optical communications system between a transmitter and a receiver when said program is run on a computer, the code means comprising instructions for controlling the system to:

analyze the electrical digital signal to derive information concerning characteristics of individual spans from the electrical digital signal (see col. 10, lines 53-67 to col. 11, lines 1-7; col. 12, lines 66-67 to col. 13, lines 1-13) by spatially resolving non-linear distortion from different parts of the optical communication link (col. 13, lines 14-59 discloses various devices/components may be placed in the transmission line; col. 14, lines 25-37 described that the optical component may be optical fiber; and col. 19, lines 8-17 disclose digitally measuring the effects of non-linear distortions of the devices located in the transmission line; the term "spatially resolving" has been broadly interpreted as *obtaining various measurements in the transmission line and determining error based on such measurement*), wherein the digital electrical signal is derived from

an optical signal which have been received at the receiver from the transmitter has been converted to an electrical signal and has been converted from analogue to digital form (it is inherent that the optical signal in converted to electrical signal to be processed digitally by the processor).

Franco et al do not disclose converting the analogue signal to digital signal, however, Franco et al teach digital signal. Therefore, it would have been obvious that there exist analog to digital signal converter in order to enable interface between optical signal and digital processor. Furthermore, it would have been obvious that the processor comprises instruction to perform the analysis.

Regarding claim 42, Franco et al do not disclose wherein the code means comprises instructions for controlling the system to analyze a self phase modulation effect within the received signal in service or at installation of the system, and/or to analyze a cross phase modulation effect within the received signal. However, it would have been obvious to an artisan of ordinary skill in the art to analyze the signal at installation.

### ***Allowable Subject Matter***

3. Claims 6, 8-14 and 30-36, 39 and 40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.



***Response to Arguments***

4. Applicant's arguments filed 05 March 2008 have been fully considered but they are not persuasive.

On page 11 of the remark, applicant indicates that that "there is no disclosure or suggestion of ... analysis in the electrical domain of a received signal to provide information concerning the characteristics of different spans of the optical link, as claimed." However, Franco et al discloses in col. 13, lines 14-59 discloses various devices/components may be placed in the transmission line; col. 14, lines 25-37 described that the optical component may be optical fiber; and col. 19, lines 8-17 disclose digitally measuring the effects of non-linear distortions of the devices/components located in the transmission line. The measured value for example, Q-factor or bit-error rate or eye-diagram suggests/indicates characteristics of the span.

***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalzid Singh whose telephone number is (571) 272-3029. The examiner can normally be reached on Mon-Fri 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dalzid Singh/  
Primary Examiner  
Art Unit 2613